UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

Note to Reader

Background: As part of its effort to involve the public in the implementation of the Food Quality Protection Act of 1996 (FQPA), which is designed to ensure that the United States continues to have the safest and most abundant food supply. EPA is undertaking an effort to open public dockets on the organophosphate pesticides. These dockets will make available to all interested parties documents that were developed as part of the U.S. Environmental Protection Agency's process for making reregistration eligibility decisions and tolerance reassessments consistent with FQPA. The dockets include preliminary health assessments and, where available, ecological risk assessments conducted by EPA, rebuttals or corrections to the risk assessments submitted by chemical registrants, and the Agency's response to the registrants' submissions.

The analyses contained in this docket are preliminary in nature and represent the information available to EPA at the time they were prepared. Additional information may have been submitted to EPA which has not yet been incorporated into these analyses, and registrants or others may be developing relevant information. It's common and appropriate that new information and analyses will be used to revise and refine the evaluations contained in these dockets to make them more comprehensive and realistic. The Agency cautions against premature conclusions based on these preliminary assessments and against any use of information contained in these documents out of their full context. Throughout this process, If unacceptable risks are identified, EPA will act to reduce or eliminate the risks.

There is a 60 day comment period in which the public and all interested parties are invited to submit comments on the information in this docket. Comments should directly relate to this organophosphate and to the information and issues available in the information docket. Once the comment period closes, EPA will review all comments and revise the risk assessments, as necessary.

These preliminary risk assessments represent an early stage in the process by which EPA is evaluating the regulatory requirements applicable to existing pesticides. Through this opportunity for notice and comment, the Agency hopes to advance the openness and scientific soundness underpinning its decisions. This process is designed to assure that America continues to enjoy the safest and most abundant food supply. Through implementation of EPA's tolerance reassessment program under the Food Quality Protection Act, the food supply will become even safer. Leading health experts recommend that all people eat a wide variety of foods, including at least five servings of fruits and vegetables a day.

Note: This sheet is provided to help the reader understand how refined and developed the pesticide file is as of the date prepared, what if any changes have occurred recently, and what new information, if any, is expected to be included in the analysis before decisions are made. **It is not meant to be a summary of all current information regarding the chemical.** Rather, the sheet provides some context to better understand the substantive material in the docket (RED chapters, registrant rebuttals, Agency responses to rebuttals, etc.) for this pesticide.

Further, in some cases, differences may be noted between the RED chapters and the Agency's comprehensive reports on the hazard identification information and safety factors for all organophosphates. In these cases, information in the comprehensive reports is the most current and will, barring the submission of more data that the Agency finds useful, be used in the risk assessments.

Jack E. Housenger, Acting Director
Special Review and Reregistration Division

HED Doc. No. 014003

February 23, 2000

MEMORANDUM

SUBJECT: ***DICHLORVOS (DDVP)*** - Reassessment Report of the FQPA Safety Factor Committee.

NOTE: THIS REPORT REPLACES THE PREVIOUS REPORT OF THE FQPA SAFETY FACTOR COMMITTEE DATED JUNE 2, 1998 (HED Doc. No. 012631).

FROM: Brenda Tarplee, Executive Secretary
FQPA Safety Factor Committee
Health Effects Division (7509C)

THROUGH: Ed Zager, Chairman
FQPA Safety Factor Committee
Health Effects Division (7509C)

TO: Susan Hummel, Risk Assessor
Reregistration Branch 4
Health Effects Division (7509C)

PC Code: 084001

The Health Effects Division (HED) FQPA Safety Factor Committee (FQPA SFC) met on January 18, 2000 to re-evaluate the hazard and exposure data for Dichlorvos and maintained that the FQPA safety factor (as required by the Food Quality Protection Act of August 3, 1996) should be reduced to 3x when assessing the risks posed by the use of this pesticide. This report replaces the previous report of the FQPA SFC dated June 2, 1998 (HED Doc. No. 012631).

I. HAZARD ASSESSMENT

(*Correspondence:* S. Hummel to B. Tarplee dated January 13, 2000)

Since the last FQPA SFC meeting in May 1998, the toxicology database for Dichlorvos has been re-evaluated by the HED Hazard Identification Assessment Review Committee (HIARC) on Feb. 18, 1999, May 27, 1999, and August 5, 1999. For complete details on the conclusions of these meetings, refer to the respective Reports of the HIARC: Doc. Nos. 013434; 013427; and 013680**.**

1. Adequacy of Toxicology Database

There are no data gaps for the *standard* Subdivision F Guideline requirements for a food-use chemical by 40 CFR Part 158, however, a developmental neurotoxicity study in rats with Dichlorvos has been required by the HIARC:

> On May 7, 1998, HIARC reviewed an open literature study (Mehl et al.;1994) reporting decreased total brain weight in two litters of guinea pig pups produced by dams which had been exposed to Dichlorvos twice daily. Although there were doubts about the reliability of the Mehl, et. al., study, it raised the concern for potential increased susceptibility of infants and children. Based on the concern for the findings of this study, the HIARC requested that a new developmental toxicity study in guinea pigs be conducted with certain protocol modifications (including examination of brain weight) to replicate/confirm the findings of the Mehl study (HIARC meeting held May 07, 1998; HED Doc. No. 012629).
>
> On May 27, 1999, the HIARC reviewed AMVACs submission that provided additional information regarding the Mehl study and concluded that the study had limitations which raised doubts about the reliability of the data. Due to deficiencies in the Mehl study (e.g., lack of historical control data) and other factors (e.g., guinea pigs are not the typical species for conducting developmental studies), the HIARC concluded that it would not be appropriate to conduct a prenatal developmental study in guinea pigs.
>
> Following re-evaluation of the available data from the guinea pig study by Mehl et al (1994), the HIARC withdrew the requirement for a prenatal developmental study in the guinea pig.
>
> The HIARC determined that a developmental neurotoxicity study (DNT) in rats would be more appropriate than a guinea pig developmental toxicity study since a DNT would allow a much broader evaluation of both the neuropathology following pre- and postnatal exposures as well as behavioral testing. Therefore, the HIARC concluded that a developmental neurotoxicity study in rats with Dichlorvos is required (HED Doc. Nos. 013427 and 013680).

2. Determination of Susceptibility

The available studies did not demonstrate increased susceptibility of rats or rabbits to *in utero* and/or postnatal exposure to Dichlorvos. In the prenatal developmental studies in rats and rabbits and in the two generation reproduction study in rats, toxicity to the offspring occurred at or above doses that were toxic to the parental animals.

In rat and rabbit developmental toxicity studies, no developmental toxicity was observed at the highest dose tested. The maternal effects included mortality (rabbits only), clinical signs and decrease in body weight gains. In the reproduction study in rats, the LOAEL (7592 μg/kg/day) produced abnormal estrus cycling, reduced fertility and pregnancy in parental animals but only slightly (and nonstatistically significant) decreased the survival of pups in F1 generation only. These effects were seen only at the highest dose (7592 μg/kg/day) and the dosing was variable.

3. Structural Activity Relationship

The HIARC reviewed published data on trichlorfon since Dichlorvos is the active metabolite of trichlorfon. These studies were conducted to assess the neurological effects of trichlorfon and similar compounds on the developing fetus/offspring. However, these studies did not report effects on maternal animals and therefore, susceptibility cannot be assessed. The HIARC noted that effects in guinea pigs and mini-pigs were seen following oral exposure of trichlorfon (Berge, GN. et al.1986; 1987a and b; Hjelde, T et al.1998; Knox, B. et al.1978; Mehl, N. et al.1994; and Pope, A. et al.1986). Together, these studies show that mid- to late-gestational exposures to pigs (or guinea pigs) to trichlorfon in the dose range of 50-100 mg/kg for 1-5 days, results in cerebellar and sometimes cerebral hypoplasia that is poorly correlated with body weight loss but well correlated with total brain weight loss. The Berge study repeatedly report purkinjie cell loss and other histopathological findings, but the Pope study failed to confirm this. The Berge study also find decreases in cholinergic and GABA-ergic marker enzymes.

Based on these published data, the HIARC reiterated its concern for the developmental effects seen with trichlorfon since Dichlorvos is the active metabolite of trichlorfon.

II. EXPOSURE ASSESSMENT

(*Correspondence:* S. Hummel to B. Tarplee dated January 13, 2000)

1. Dietary (Food) Exposure Considerations

Tolerances for plant and animal commodities currently listed in 40 CFR 180.235(a) are for residues of Dichlorvos *per se.* Tolerances range from 0.02 to 2 ppm but are currently undergoing tolerance reassessment for the HED Chapter of the RED. Reassessed

tolerances range from 0.02 to 20 ppm. The Codex Alimentarius Commission has established several maximum residue limits (MRLs) for residues of Dichlorvos in/on various commodities. The Codex MRLs are expressed in terms of Dichlorvos *per se* and are based on residues likely to be found at harvest or slaughter. The following conclusions can be made regarding efforts to harmonize U.S. tolerances with Codex MRLs: 1) compatibility between the U.S. tolerances and Codex MRLs exists for milk, mushrooms, meat (from mammals other than marine mammals), and poultry; and 2) incompatibility of the U.S. tolerances and Codex MRLs remains for cereal grains and peanuts because of differences in good agricultural practices.

Residues of Dichlorvos are probably surface residues which are reduced in washing and cooking, and the amount of reduction is related to the temperature and the length of the heating. There is some likelihood of transfer of residues to meat and milk from dermal application, however, there was virtually no residue transfer from secondary residues.

The HED Dietary Exposure Evaluation Model (DEEM) is used to assess the acute and chronic risk from dietary exposure to Dichlorvos in food. These analyses are highly refined using anticipated residues for Dichlorvos where possible for dietary exposure assessment. Anticipated residues were based on the average residue found in monitoring data, primarily from the Pesticide Data Program (PDP) for fresh fruits and vegetables; monitoring data from the FDA total diet study for grain products and dried fruits; monitoring data from FDA for strawberries; or in field trials or where Dichlorvos was used at the maximum typical application rate for other commodities. Residues in meat commodities were estimated from residues in milk since Dichlorvos was not analyzed in meat products in the FDA Total diet study and there were no acceptable monitoring data from USDA-FSIS in meat and poultry products. Limits of detection are 0.01 ppm or lower. The LOQ for the FDA Total Diet Study was about 1 ppb. Most monitoring samples had non-detectable residues. A notable exception was strawberries. Finite residues were reported in most field trials. A Tier 4 acute dietary exposure assessment is in process.

2. Dietary (Drinking Water) Exposure Considerations

Dichlorvos (DDVP) residues can be present in the environment as a result of use of three pesticides: DDVP, Naled, and Trichlorfon. DDVP is a degradate of Naled and Trichlorfon. The EFED drinking water assessment considers the potential for DDVP to contaminate water from these sources.

Screening models were used to determine estimated concentrations of DDVP in groundwater and surface water. Although these estimates are only for DDVP, there are several DDVP degradates that have been identified including desmethyl DDVP (Methyl O-(2,2-dichlorovinyl) phosphate), dichlorethanol, and dichloroacetic acid; this later

degradate is very mobile. If HED determines that these degradates are toxicologically significant, the concentrations for these compounds will be estimated as well.

The **SCI-GROW** screening model developed in EFED indicates that Naled, trichlorfon, or DDVP will not be found in significant concentrations in groundwater. Concentrations of these compounds were calculated based on a maximum annual application rate of 9.375 lb a.i/acre for Naled (the use rate on Cole crops), 8.17 lb a.i./acre for trichlorfon (turf), and 0.2 lb a.i./acre for DDVP (turf). The maximum amount of DDVP formed from Naled is approximately 20 percent of the amount of Naled originally applied. Therefore, a conservative DDVP use rate was selected as Naled's use rate multiplied by 0.20. The application rate for DDVP formed from trichlorfon was estimated by multiplying trichlorfon's application rate (8.17 lab a.i/acre) by the maximum percent of DDVP (56%) formed as a trichlorfon degradate determined from the trichlorfon aerobic aquatic metabolism at pH 8.5. Since the groundwater concentrations were developed through a screening model and no monitoring data were used, we are only moderately confident of these estimates. However, the groundwater concentrations estimated from the modeling do agree with limited existing groundwater monitoring data for these compounds. Monitoring data reviewed indicated that neither Naled, DDVP, nor trichlorfon has been detected in groundwater. These data were not targeted to the pesticide use area.

The **PRZM-EXAMS** models were used to estimate surface water concentrations for Naled, trichlorfon and DDVP. Turf was used as the site of interest for trichlorfon. General outdoor uses (including turf) were used as the site of interest for DDVP. Eight crops were simulated for Naled. The modeling results indicate that all these compounds have the potential to contaminate surface waters by runoff, for short periods of time especially in areas with large amounts of annual rainfall. However, based on its environmental fate characteristics, Naled will degrade/dissipate rapidly ($t_{1/2}$ < 1 day), trichlorfon and DDVP will persist slightly longer ($t_{1/2}$ 1.4 and ~ 5 days, respectively). Mitigation practices that reduce runoff could be effective in reduction of these chemicals transport into surface waters.

DDVP may reach surface water as a result of use of three pesticides: Dichlorvos (DDVP), Naled and trichlorfon. In the event that all of these pesticides are used in the same use area, then the contribution for each chemical should be incorporated in any risk assessment.

3. Residential (Non-Occupational) Exposure Considerations

Residential (non-occupational) uses of Dichlorvos include home lawn products, aerosol foggers, and pest strips. Post application exposure to infants and children could occur with these uses.

Proprietary, chemical specific data (including biomonitoring data) are used in the residential post-application assessments for outdoor turf and indoor carpet exposures to

Dichlorvos. Since the last FQPA SFC meeting in May 1998, additional data have been received and incorporated into the risk assessment for turf use scenarios. Other revisions to the residential risk assessment for Dichlorvos include: the use of the Residential SOP activity pattern assumptions, including hand-to-mouth activity; the advice of the HED Exposure Science Advisory Committee (SAC); and to extent possible, the inclusion of the recommendations of the FIFRA Scientific Advisory Panel which reviewed the HED exposure assessment approach for resin strip products containing DDVP in July 1998 (See attachment 1).

III. SAFETY FACTOR RECOMMENDATION AND RATIONALE

1. Recommendation of the Factor

The FQPA SFC recommended that the 10x Safety Factor for increased susceptibility of infants and children should be reduced to 3x.

2. Rationale for Selection of the FQPA Safety Factor

The Committee concluded that a safety factor is required for Dichlorvos based on the data gap for the developmental neurotoxicity study in rats required due to concern for the effects seen following exposure to trichlorfon reported in the open literature since Dichlorvos is the active metabolite of trichlorfon.

However, it was determined that the10x FQPA safety factor can be reduced to 3x because: 1) the standard developmental and reproductive toxicity studies submitted to the Agency showed no indication of increased susceptibility of rats, mice, or rabbits to *in utero* and/or postnatal exposure to Dichlorvos; and 2) the dietary (food and drinking water) and non-dietary (residential) risk assessments will not underestimate the potential exposures for infants and children from the use of Dichlorvos.

3. Application of the Safety Factor - Population Subgroups / Risk Assessment Scenarios

The FQPA safety factor is applicable to **All Population Subgroups for Acute and Chronic Dietary Exposures and Residential (Non-occupational) Exposures of All Durations** since there is concern for effects seen following exposure to trichlorfon and there is a data gap for a developmental neurotoxicity study in rats which may further characterize the effects of Dichlorvos on the developing organism.

Attachment 1.

February 4, 2000

MEMORANDUM

SUBJECT: RESPONSE TO FQPA COMMITTEE REQUEST REGARDING SAP COMMENTS FOR DDVP RESIN STRIPS (PC Code 084001, Case No. 819293, Barcode D251331)

FROM: David Jaquith
Reregistration Action Branch 4
Health Effects Division (7509C)

TO: Sue Hummel, Senior Scientist
Reregistration Action Branch 4
Health Effects Division (7509C)

In July 1998 the Agency presented exposure assessments for resin strip products containing DDVP to the FIFRA Scientific Advisory Panel (SAP). Four methods for determining respiratory exposure were presented. The SAP recommended that a time weighted average approach be used to address this exposure scenario.
This approach, after correction of a mathematical error was used for the resin strip assessment in the Reregistration Eligibility Document (RED) for this compound. The results of the chronic and acute exposure risks from that document are presented in Tables 1 and 2. The SAP had additional comments concerning the Agency's risk assessment for these products.

The Panel "expressed concern that the Agency's current exposure assessment for DDVP resin strips (and perhaps for indoor residential exposures in general) fails to address the multi-route nature of residential exposure. The four exposure models consider only exposure by inhalation, and therefore neglect to consider DDVP concentrations in rugs, upholstery, or clothing which may lead to dermal exposure and/or oral exposure (i.e. hand to mouth activities). All of these are known to be sinks for organic molecules, and the behavior of toddlers, ignored in all models, makes these data of critical importance. Children of this age spend large amounts of time crawling over carpets, and putting their hands in their mouths. None of the models include such sources and pathways, and so suffer from a substantial specification error. One Panel member recounted recent research findings which have shown that residues of

dichlorvos in soil vacuumed from carpet increased some 70 times over a 5 to 6 month period (ca. 0.01 ppm, 14 days; 0.7 ppm, 150 days) following an outdoor perimeter application. The formulation used was a combination of chlorpyrifos/dichlorvos. How much of this residue was transferred either to the skin or from hand to mouth contact is unknown, but one can assume that some gets into the body. Data including soil, surface and airborne residues should be included in any exposure model. In summary, the data on which the Agency's current residential exposure assessment for DDVP resin strips is based must be considered incomplete. The registrant should be requested to furnish this information to allow an informed estimate of exposure to be made."

The Agency has no data addressing surface residues that might arise from the use of a resin strip but notes that the concentrations found in the air in the study, which are presented in Table 3, are quite low. Most are less than 100 ng per liter. It is further noted that residues in foodstuffs monitored at the same time as the air measurements yielded almost all non-detect levels of the chemical, indicating that little or no chemical was adsorbed on these items. At these low concentrations the Agency concluded that, while possible, the relative contribution of any vapor molecules that do contact a surface would likely be much smaller than the contribution to total exposure via the respiratory route for resin strips and would add little to the risk assessment. Surface residues are however addressed in total release fogger and lawn care scenarios.

The Panel noted that "none of the models take into account the factors affecting pesticide movement indoors. The environmental conditions (e.g., temperature, relative humidity) that an individual maintains will vary from house to house. In addition, the way a house is kept (i.e., cleaning frequency), traffic patterns, the presence of children and pets all impact on pesticide movement and concentration. It may prove impossible to collect reliable data on all such factors affecting residential exposures, but Agency assessments should address these concerns and consider the uncertainty associated with them in any exposure models or calculations. The Panel reiterated its support of the use of the Agency's Standard Operating Procedures (SOPs) for residential exposures. The SOPs were reviewed by the Panel at its September, 1997 meeting."

There are no available data with which to quantify the effects of temperature, humidity, environmental conditions, or movement ain a house relative to a pest strip. It is the assumption that when monitoring is conducted in occupied houses under "real world" conditions these factors are included in the measurement, although they cannot be partitioned out. The data used for the assessment provided to the SAP is supported by additional information provided by the registrant in which over 100 homes were monitored. The residential SOPs supported by the SAP were intended to be a screen to be used when compound/scenario specific data were not available. In this case compound/product specific data were available and used instead of the default values in the residential SOPs.

“An additional issue raised in the discussion of DDVP resin strips related to the relevance of real world exposures for risk management. The central point is whether Agency exposure analyses should be bounded by label requirements, or whether they should incorporate knowledge of real world exposure conditions. The specific issue involved the appropriate duration of a time-weighted average (TWA) calculation for residential exposure. Agency analyses of the Collines and DeVries data presented to the Panel included a one day (Day 1) dose estimate, a 56 day analysis using the MCCE Model, and a 91 day TWA calculation. The product label recommends replacement of pest strips after 120 days. A public comment during the meeting by the DDVP registrant indicated that the TWA should be calculated for this time interval. Other label instructions which might be construed as boundaries for exposure analysis include no use of resin strips in homes with infants, no use in children's bedrooms, and no use in food preparation or consumption areas. The Panel believes it is reasonable and important to consider whether a consumer who has just purchased a product to rid a residence of insects will necessarily comply with all of these restrictions. If not, then the Agency needs to determine how to ensure protection for residential occupants, particularly for infants and children.

The notion that exposure analyses must be bound by label requirements rather than real world exposures may have originated in studies of occupational pesticide exposure. In the case of restricted use pesticides, for example, sales are restricted to vendors who are aware of their potential hazards, and the compounds can be applied only by individuals who have been certified as applicators (or those who work under the direct supervision of a certified applicator). The ability to read and understand the label is tested, and continuing education and periodic recertification are required. Also, the Agency has the ability to enforce adherence to label requirements and apply meaningful penalties (e.g., loss of certification). The actual practice has its problems, but the point here is that the regulatory system is designed to control use practices.

Residential exposures, however, differ in nearly all respects from the pesticide applicator example: products such as resin strips are sold "over the counter" and are widely available; sales people are unlikely to be knowledgeable about risks; consumers exhibit great variability in literacy, command of the English language, and predispositions to read or follow label instructions. Monitoring of residential uses is not conducted by federal or state agencies, nor apparently by the registrant, and regulatory agencies are extremely reluctant to enforce label requirements in private residences.

The Panel believes that better knowledge of real world use practices would serve to improve residential exposure analyses, and that the lack of knowledge about actual use (and misuse) for such consumer products as resin strips is an important area of uncertainty in residential exposure analysis. The Panel encourages the Agency and registrants to consider collecting such data to improve estimates of residential exposures.”

The Agency lacks the resources or perhaps the regulatory power to address misuse of a resin strip product in the residential environment. Examination of the incidence data for this product shows that there are relatively few incidences. This would support the

concept that these products are being used according to label instructions. The study used for risk assessment placed no restrictions on either the number of strips used or the placement of those strips. Some of the strips were located in the kitchen, which was legal at the time, and would address the potential misuse that concerned the Panel.

The Agency further notes that the study used for determination of the inhalation NOAEL was conducted in a total body exposure scenario in which there will always be some oral and dermal component. This would also help to address the SAP concerns about multiple route exposures, although quantification of the various pathways is not possible.

Table 1. Daily DDVP Concentrations, Chronic Exposures and MOEs of Individuals Occupying Homes in Which Resin Strips Are Installed.

Home	Exposure (µg/kg/day)				Chronic MOE's			
ID	Child 1-4	Child 5-11	Adult (F)	Adult (M)	Child 1-4	Child 5-11	Adult (F)	Adult (M)
1W	0.0029	0.0020	0.0009	0.0011	17	26	54	47
2C	0.0099	0.0067	0.0032	0.0037	5	7	16	14
3C	0.0045	0.0031	0.0015	0.0017	11	16	34	29
4N	0.0026	0.0018	0.0008	0.0010	19	28	59	51
5N	0.0037	0.0025	0.0012	0.0014	14	20	42	37
6N	0.0068	0.0046	0.0022	0.0025	7	11	23	20
7W	0.0083	0.0056	0.0027	0.0031	6	9	19	16
8W	0.0032	0.0022	0.0010	0.0012	16	23	48	42
9C	0.0024	0.0017	0.0008	0.0009	20	30	63	55
10C	0.0123	0.0084	0.0040	0.0046	4	6	13	11
11C	0.0046	0.0031	0.0015	0.0017	11	16	34	29
12N	0.0060	0.0041	0.0020	0.0023	8	12	25	22
13W	0.0087	0.0059	0.0028	0.0032	6	8	18	15
14W	0.0070	0.0048	0.0023	0.0026	7	11	22	19
15N	0.0040	0.0027	0.0013	0.0015	13	19	39	34

Input Parameters: BW: Child 1-4 = 15 kg; Child 5-11 = 22 kg; Adult Female = 60 kg; Adult Male = 70 kg
Daily Respiratory Volume: Child 1-4 = 8700 L/day; Child 5-11 = 8700 L/day; Adult Female = 11300 L/day; Adult Male = 15200 L/day

Table 2. DDVP Concentrations On the First Day After Installation, Acute Exposures, and MOEs of Individuals Occupying Homes in Which Resin Strips Are Installed.

Home ID	Acute Doses (µg/kg/day)[1]				Acute MOE's			
	Child 1-4	Child 5-11	Adult (F)	Adult (M)	Child 1-4	Child 5-11	Adult (F)	Adult (M)
1W	0.0077	0.0053	0.0025	0.0029	65	95	199	173
2C	0.0309	0.0211	0.0100	0.0116	16	24	50	43
3C	0.0155	0.0106	0.0050	0.0058	32	47	100	86
4N	0.0077	0.0053	0.0025	0.0029	65	95	199	173
5N	0.0193	0.0132	0.0063	0.0072	26	38	80	69
6N	0.0426	0.0290	0.0138	0.0159	12	17	36	31
7W	0.0426	0.0290	0.0138	0.0159	12	17	36	31
8W	0.0077	0.0053	0.0025	0.0029	65	95	199	173
9C	0.0039	0.0026	0.0013	0.0014	129	190	398	345
10C	0.0271	0.0185	0.0088	0.0101	18	27	57	49
11C	0.0193	0.0132	0.0063	0.0072	26	38	80	69
12N	0.0193	0.0132	0.0063	0.0072	26	38	80	69
13W	0.0271	0.0185	0.0088	0.0101	18	27	57	49
14W	0.0309	0.0211	0.0100	0.0116	16	24	50	43
15N	0.0155	0.0106	0.0050	0.0058	32	47	100	86

[1] Using measured exposures on day 1.

[2] Input Parameters: Body Weight: Child 1-4 = 15 kg; Child 5-11 = 22 kg; Adult Female = 60 kg; Adult Male = 70 kg
Daily Respiratory Volume: Child 1-4 = 8700 L/day; Child 5-11 = 8700 L/day; Adult Female = 11300 L/day; Adult Male = 15200 L/day

Table 3. Air Concentrations of Dichlorvos (DDVP) in Fifteen Homes in Which Pest Strips Were Installed.

Home ID	Air Cond. type	Rate (ft^3/strip)	Air Concentration (µg/L)						Exponential Decay Parameters		Area Under Curve AUC	Daily Conc. (µg/L) (AUC/120)
			1 Day	7 Days	14 Days	28 Days	56 Days	91 Days	value k	value C0		
1W	Window	1270	0.02	0.02	0.020	0.005[1]	0.005	0.005	0.0177	0.0179	0.8892	0.0074
2C	Central	1440	0.08	0.07	0.07	0.05	0.005	0.020	0.0229	0.0749	3.0670	0.0256
3C	Central	1410	0.04	0.03	0.03	0.01	0.01	0.005	0.0223	0.0337	1.4056	0.0117
4N	None	1410	0.02	0.02	0.01	0.005	0.005	0.005	0.0156	0.0148	0.8069	0.0067
5N	None	1730	0.05	0.02	0.02	0.01	0.005	0.005	0.0232	0.0280	1.1328	0.0094
6N	None	720	0.11	0.06	0.02	0.03	0.01	0.005	0.0303	0.0653	2.0981	0.0175
7W	Window	1080	0.11	0.05	0.06	0.02	0.02	0.005	0.0300	0.0790	2.5617	0.0213
8W	Window	2130	0.02	0.02	0.02	0.01	0.005	0.005	0.0183	0.0205	0.9942	0.0083
9C	Central	6790	0.01	0.01	0.02	0.005	0.005	0.005	0.0111	0.0114	0.7583	0.0063
10C	Central	1500	0.07	0.09	0.06	0.04	0.02	0.020	0.0172	0.0751	3.8113	0.0318
11C	Central	2050	0.05	0.04	0.02	0.02	0.005	0.005	0.0267	0.0396	1.4225	0.0119
12N	None	1550	0.05	0.07	0.02	0.03	0.01	0.005	0.0268	0.0523	1.8754	0.0156
13W	Window	1230	0.07	0.08	0.04	0.04	0.02	0.005	0.0289	0.0802	2.6883	0.0224
14W	Window	1500	0.08	0.05	0.04	0.03	0.01	0.005	0.0300	0.0668	2.1645	0.0180
15N	None	1680	0.04	0.02	0.02	0.02	0.005	0.005	0.0225	0.0297	1.2271	0.0102

[1] The level of detection was 0.01 µg/L, a value of 0.005 was used for these samples.